K132801

MAY 2 8 2014

SIEMENS

510(k) Summary

Introduction: According to the requirements of 21 CFR 807.92, the following information provides sufficient details to understand the basis for determination of substantial equivalence.

The assigned 510(k) Number : K132801

1. **Date Prepared:** May 23rd, 2014

2. **Submitter**

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3. **Device Name**

Proprietary Name: IMMULITE® 2000 3gAllergy™ Specific IgE Universal Kit
Device Common Name: Radioallergosorbent (RAST) Immunological Test System
Regulation Number: 866.5750
Classification: Class II
Classification Products Code: DHB
Panel: Immunology (82)

4. **Predicate Device Name** IMMULITE® 2000 3gAllergy™ Specific IgE Assay

FDA clearance was previously obtained for the assay kit and 111 specific allergens (K093987, K100910, K101572 and K112523).

5. **Device Description:** IMMULITE® 2000 3gAllergy™ Specific IgE Universal Kit assay is a solid-phase, two-step, chemiluminescent immunoassay that exploits liquid phase kinetics in a bead format. It represents a significant advance over conventional methods relying on allergens attached to a solid-phase support. The allergens are covalently bound to a soluble polymer/co-polymer matrix, which in turn is labeled with a ligand. The use of an amino acid co-polymer amplifies the amount of allergen that the matrix can support.
This 510(k) submission is for clearance of seven additional specific molecular allergens shown in Table 1 to be used with the IMMULITE® 2000 3gAllergy™ Specific IgE Universal Kit on the IMMULITE® 2000 analyzer.

Table 1: Specific Molecular Allergens

1 rBet v 2: Birch pollen *(Betula verrucosa)*
2 rMal d 1: Apple *(Malus domestica)*
3 rPru av 1: Cherry *(Prunus avium)*
4 rPru av3: Cherry (Prunus avium)
5 rPru av 4: Cherry *(Prunus avium)*
6 nPru p 3: Peach *(Prunus persica)*
7 rMal d 4: Apple *(Malus domestica)*

6. **Intended Use:**
Indication for Use:

See Indications for Use Statement below
The IMMULITE® 2000 3gAllergy™ Specific IgE Universal Kit is for in vitro diagnostic use with the IMMULITE® 2000 Analyzer — for the quantitative measurement of allergen-specific IgE in human serum, as an aid in the clinical diagnosis of IgE-mediated allergic disorders. The test results are to be used in conjunction with clinical findings and other laboratory tests.

Special Conditions for Use Statement(s):
For prescription use only

Special Instrument Requirements:
IMMULITE® 2000 Systems

7. **Technological Characteristics and Substantial Equivalence Comparison with Predicate:**

A comparison of the device features, intended use, and other information demonstrates that the IMMULITE 2000 3gAllergy™ Specific IgE Universal Kit is substantially equivalent to the predicate device summarized in Table 2.

Table 2: Substantial Equivalence Comparison

Similarities		
Description Item	**Candidate Device :IMMULITE® 2000 3gAllergy™ Specific IgE Universal Kit**	**Predicate Device: (k112523)**
Indication for Use	The IMMULITE® 2000 3gAllergy™ Specific IgE Universal Kit is for in vitro diagnostic use with the IMMULITE® 2000 Analyzer— for the quantitative measurement of allergen-specific IgE in human serum, as an aid in the clinical diagnosis of IgE-mediated allergic disorders. The test results are to be used in conjunction with clinical findings and other laboratory tests.	Same
Number of Calibrators	Eight	Same
Sample Matrix	Serum	Same
Antibody	Monoclonal murine anti-human IgE conjugated to alkaline phosphatase	Same
Basic Principle	Chemiluminescent Immunoassay	Same
Sample Volume	50 µl	Same
Process Time	65 minutes	Same
Incubation Temperature	37°C	Same

Differences		
Description Item	**Candidate Device :IMMULITE® 2000 3gAllergy™ Specific IgE Universal Kit**	**Predicate Device: (k112523)**
Allergen Source	Allergenic proteins expressed by recombinant techniques or purified from native sources.	Whole allergen extracts or Allergenic proteins purified from native sources only.

8. Non-Clinical Performance Testing

Performance testing has been carried out to demonstrate that this device meets the performance specifications for its intend use. The following tests were performed on the candidate device.

8.1 Precision

Precision studies were performed in accordance with Clinical Laboratory Standard Institute (CLSI) guidance: *Evaluation of Precision Performance of Quantitative Methods; Approved Guideline-Second Edition.* CLSI document EP5-A2 (ISBN 1-56238-542-9). CLSI, 940 West Valley Road, Suite 1400, Wayne, Pennsylvania 19087-1898 USA, 2004 assaying each test sample in two runs per day on 20 different days. Analysis of variance was used to estimate the repeatability and within-lab precision.

Four allergen lots were tested using three positive samples and one negative control sample. Repeatability, within-lab, and lot-to-lot precision for the positive samples were evaluated by calculating the kU/L dose percent coefficients of variation (%CV) for each positive sample. Non-specific binding (NSB) was monitored by testing the negative control sample. Precision outliers according to the >3.0 SD rule are attributed to sample specific issues and/or operator error. In these cases precision results will be included with and without outliers. Representative precision claims for each allergen tested are presented in Table 3.

Precision studies were conducted using instruments I3325 and I3474 for lots 110, 111, and 112 and instruments I3325 and I3476 for lot 201. Data for each lot on each instrument is presented below:

Table 3 – Repeatability and Within-Lab Precision Results

Sample	N	Mean (kU/L)	Repeatability SD (kU/L)	Repeatability CV %	Within-Lab SD (kU/L)	Within-Lab CV %
Allergen = rBet v 2, Lot 110, I3325						
Positive 1	84	0.60	0.020	3.40	0.043	7.17
Positive 2	84	1.62	0.053	3.30	0.096	5.91
Positive 3	84	8.16	0.293	3.59	0.598	7.33

Allergen = rBet v 2, Lot 110, I3474						
Positive 1	84	0.63	0.026	4.13	0.036	5.66
Positive 2	84	1.70	0.057	3.33	0.097	5.69
Positive 3	84	8.41	0.334	3.98	0.440	5.23
Allergen = rBet v 2, Lot 111, I3325						
Positive 1	84	0.60	0.021	3.51	0.037	6.15
Positive 2	84	1.62	0.057	3.52	0.102	6.31
Positive 3	84	8.20	0.280	3.42	0.577	7.04
Allergen = rBet v 2, Lot 111, I3474						
Positive 1	84	0.64	0.032	4.97	0.041	6.36
Positive 2	84	1.71	0.052	3.03	0.089	5.21
Positive 3	84	8.44	0.316	3.74	0.396	4.69
Allergen = rBet v 2, Lot 112, I3325						
Positive 1	84	0.60	0.019	3.09	0.038	6.43
Positive 2	84	1.62	0.058	3.57	0.104	6.44
Positive 3	84	8.30	0.247	2.97	0.603	7.26
Allergen = rBet v 2, Lot 112, I3474						
Positive 1	84	0.63	0.032	5.07	0.046	7.32
Positive 2	84	1.71	0.065	3.80	0.102	5.97
Positive 3	84	8.46	0.299	3.54	0.462	5.46
Allergen = rBet v 2, Lot 201, I3325						
Positive 1	80	0.46	0.016	3.49	0.022	4.63
Positive 2	80	1.34	0.046	3.41	0.058	4.36
Positive 3	80	6.68	0.220	3.30	0.278	4.16
Allergen = rBet v 2, Lot 201, I3476						
Positive 1	80	0.49	0.019	3.89	0.035	7.17
Positive 2	80	1.43	0.047	3.30	0.075	5.20
Positive 3	80	7.18	0.243	3.39	0.413	5.75
Allergen = rMal d 1, Lot 110, I3325						
Positive 1	84	0.57	0.026	4.58	0.042	7.27
Positive 2	84	2.78	0.115	4.14	0.200	7.18
Positive 3	84	5.64	0.236	4.18	0.418	7.41
Allergen = rMal d 1, Lot 110, I3474						
Positive 1	84	0.60	0.027	4.60	0.044	7.45
Positive 2	84	2.97	0.158	5.32	0.206	6.92
Positive 3	84	5.85	0.221	3.78	0.286	4.89
Allergen = rMal d 1, Lot 111, I3325						
Positive 1	84	0.58	0.027	4.68	0.044	7.60
Positive 2	84	2.79	0.114	4.08	0.204	7.32
Positive 3	84	5.63	0.226	4.01	0.391	6.95

Allergen = rMal d 1, Lot 111, I3474						
Positive 1	84	0.60	0.024	4.03	0.041	6.87
Positive 2	84	2.94	0.112	3.79	0.172	5.84
Positive 3	84	5.90	0.267	4.52	0.286	4.85
Allergen = rMal d 1, Lot 112, I3325						
Positive 1	84	0.62	0.028	4.50	0.044	7.10
Positive 2	84	2.45	0.096	3.90	0.177	7.20
Positive 3	84	5.96	0.227	3.80	0.438	7.30
Allergen = rMal d 1, Lot 112, I3474						
Positive 1	84	0.64	0.031	4.90	0.054	8.50
Positive 2	84	2.59	0.106	4.10	0.201	7.80
Positive 3	84	6.06	0.284	4.70	0.396	6.50
Allergen = rMal d 1, Lot 201, I3325						
Positive 1	80	0.46	0.023	4.93	0.035	7.53
Positive 2	80	1.97	0.068	3.44	0.085	4.29
Positive 3	80	4.52	0.189	4.18	0.423	9.36
Allergen = rMal d 1, Lot 201, I3476						
Positive 1	80	0.49	0.021	4.24	0.035	7.26
Positive 2	80	2.16	0.101	4.69	0.189	8.76
Positive 3	80	4.99	0.209	4.19	0.371	7.43
Allergen = rMal d 4, Lot 110, I3325						
Positive 1	84	0.64	0.027	4.18	0.036	5.60
Positive 2	84	1.67	0.063	3.78	0.105	6.29
Positive 3	84	7.37	0.206	2.79	0.469	6.36
Allergen = rMal d 4, Lot 110, I3474						
Positive 1	84	0.67	0.021	3.14	0.038	5.64
Positive 2	84	1.73	0.052	3.02	0.108	6.21
Positive 3	84	7.70	0.291	3.77	0.323	4.19
Allergen = rMal d 4, Lot 111, I3325						
Positive 1	84	0.63	0.027	4.31	0.037	5.84
Positive 2	84	1.66	0.055	3.29	0.103	6.23
Positive 3	84	7.40	0.255	3.44	0.500	6.75
Allergen = rMal d 4, Lot 111, I3474						
Positive 1	84	0.67	0.025	3.73	0.036	5.35
Positive 2	84	1.74	0.049	2.84	0.102	5.90
Positive 3	84	7.71	0.217	2.82	0.350	4.54

Allergen = rMal d 4, Lot 112, I3325						
Positive 1	84	0.65	0.028	4.25	0.038	5.76
Positive 2	84	1.66	0.060	3.58	0.105	6.29
Positive 3	84	7.56	0.265	3.51	0.533	7.06
Allergen = rMal d 4, Lot 112, I3474						
Positive 1	84	0.69	0.022	3.13	0.041	5.88
Positive 2	84	1.75	0.056	3.23	0.090	5.16
Positive 3	84	7.90	0.264	3.35	0.377	4.78
Allergen = rMal d 4, Lot 201, I3325						
Positive 1	80	0.59	0.022	3.74	0.028	4.70
Positive 2	80	1.43	0.053	3.73	0.060	4.24
Positive 3	80	6.61	0.218	3.30	0.268	4.06
Allergen = rMal d 4, Lot 201, I3476						
Positive 1	80	0.64	0.021	3.24	0.036	5.56
Positive 2	80	1.52	0.045	2.93	0.077	5.08
Positive 3	80	7.21	0.119	1.65	0.330	4.58
Allergen = rPru av 1, Lot 110, I3325						
Positive 1	84	0.58	0.024	4.13	0.037	6.48
Positive 2*	84	2.34	0.083	3.53	0.337	14.36
Positive 2**	80	2.41	0.084	3.49	0.165	6.84
Positive 3	84	6.22	0.267	4.29	0.432	6.94
Allergen = rPru av 1, Lot 110, I3474						
Positive 1	84	0.60	0.024	4.01	0.044	7.22
Positive 2	84	2.50	0.088	3.50	0.142	5.67
Positive 3	84	6.39	0.232	3.63	0.428	6.70
Allergen = rPru av 1, Lot 111, I3325						
Positive 1	84	0.58	0.022	3.76	0.042	7.21
Positive 2*	84	2.35	0.058	2.46	0.338	14.38
Positive 2**	80	2.41	0.059	2.43	0.179	7.41
Positive 3	84	6.29	0.197	3.14	0.454	7.22
Allergen = rPru av 1, Lot 111, I3474						
Positive 1	84	0.60	0.022	3.70	0.041	6.74
Positive 2	84	2.49	0.103	4.16	0.156	6.28
Positive 3	84	6.50	0.275	4.23	0.394	6.06

Allergen = rPru av 1, Lot 112, I3325						
Positive 1	84	0.65	0.024	3.70	0.047	7.26
Positive 2*	84	2.57	0.096	3.74	0.359	13.96
Positive 2**	80	2.64	0.098	3.73	0.186	7.06
Positive 3	84	7.91	0.257	3.24	0.552	6.98
Allergen = rPru av 1, Lot 112, I3474						
Positive 1	84	0.69	0.025	3.66	0.044	6.42
Positive 2	84	2.78	0.095	3.43	0.179	6.45
Positive 3	84	8.29	0.365	4.40	0.535	6.45
Allergen = rPru av 1, Lot 201, I3325						
Positive 1	80	0.56	0.020	3.62	0.039	6.94
Positive 2	80	2.29	0.076	3.34	0.130	5.66
Positive 3	80	6.83	0.207	3.03	0.307	4.49
Allergen = rPru av 1, Lot 201, I3476						
Positive 1+	80	0.60	0.066	11.16	0.074	12.41
Positive 1**	79	0.60	0.017	2.86	0.044	7.33
Positive 2	80	2.48	0.128	5.17	0.211	8.51
Positive 3	80	7.37	0.375	5.09	0.662	8.98

*Outliers detected on Day 6, Runs 1 and 2, Replicates 1 and 2
+Outliers detected on Day 20, Run 1, Replicate 2
**No outliers used in calculation

Allergen = rPru av 3, Lot 110, I3325						
Positive 1	84	0.56	0.020	3.51	0.032	5.81
Positive 2	84	1.48	0.044	2.97	0.090	6.04
Positive 3	84	9.30	0.398	4.28	0.697	7.49
Allergen = rPru av 3, Lot 110, I3474						
Positive 1	84	0.59	0.022	3.63	0.034	5.76
Positive 2	84	1.55	0.050	3.22	0.079	5.08
Positive 3	84	9.60	0.371	3.86	0.486	5.06
Allergen = rPru av 3, Lot 111, I3325						
Positive 1	84	0.56	0.021	3.74	0.036	6.42
Positive 2	84	1.49	0.055	3.68	0.092	6.19
Positive 3	84	9.28	0.366	3.94	0.598	6.45
Allergen = rPru av 3, Lot 111, I3474						
Positive 1	84	0.59	0.020	3.34	0.034	5.74
Positive 2	84	1.56	0.050	3.21	0.079	5.03
Positive 3	84	9.66	0.331	3.43	0.509	5.27

Allergen = rPru av 3, Lot 112, I3325						
Positive 1	84	0.56	0.024	4.25	0.032	5.60
Positive 2	84	1.47	0.041	2.82	0.086	5.85
Positive 3	84	9.49	0.290	3.05	0.645	6.80
Allergen = rPru av 3, Lot 112, I3474						
Positive 1	84	0.59	0.021	3.62	0.034	5.66
Positive 2	84	1.55	0.058	3.74	0.075	4.84
Positive 3	84	9.89	0.300	3.03	0.485	4.90
Allergen = rPru av 3, Lot 201, I3325						
Positive 1*	80	0.48	0.058	12.20	0.061	12.85
Positive 1**	79	0.48	0.025	5.17	0.035	7.23
Positive 2	80	1.20	0.53	4.40	0.96	8.01
Positive 3	80	7.52	0.236	3.14	0.468	6.23
Allergen = rPru av 3, Lot 201, I3476						
Positive 1	80	0.51	0.015	2.88	0.035	6.73
Positive 2	80	1.30	0.047	3.60	0.097	7.51
Positive 3	80	8.25	0.213	2.58	0.484	5.86

*Outliers detected on Day 16, Run 1, Replicate 1
**No outliers used for calculation

Allergen = rPru av 4, Lot 110, I3325						
Positive 1	84	0.62	0.026	4.13	0.035	5.68
Positive 2*	84	1.27	0.048	3.78	0.223	17.58
Positive 2**	82	1.30	0.049	3.73	0.098	7.56
Positive 3	84	8.75	0.297	3.40	0.644	7.36
Allergen = rPru av 4, Lot 110, I3474						
Positive 1	84	0.66	0.028	4.23	0.043	6.47
Positive 2	84	1.36	0.043	3.14	0.080	5.89
Positive 3	84	9.09	0.309	3.40	0.409	4.50
Allergen = rPru av 4, Lot 111, I3325						
Positive 1	84	0.62	0.022	3.61	0.035	5.56
Positive 2*	84	1.27	0.042	3.33	0.221	17.35
Positive 2**	82	1.30	0.043	3.29	0.092	7.08
Positive 3	84	8.63	0.349	4.04	0.692	8.02
Allergen = rPru av 4, Lot 111, I3474						
Positive 1	84	0.66	0.028	4.20	0.044	6.57
Positive 2	84	1.37	0.041	2.96	0.070	5.07
Positive 3	84	9.06	0.408	4.50	0.505	5.57

Allergen = rPru av 4, Lot 112, I3325						
Positive 1	84	0.62	0.022	3.59	0.040	6.51
Positive 2*	84	1.29	0.042	3.29	0.222	17.21
Positive 2**	82	1.30	0.043	3.29	0.092	7.08
Positive 3	84	8.63	0.410	4.73	0.647	7.45
Allergen = rPru av 4, Lot 112, I3474						
Positive 1	84	0.67	0.021	3.16	0.033	4.95
Positive 2	84	1.39	0.048	3.46	0.087	6.21
Positive 3	84	6.17	0.388	4.23	0.601	6.55
Allergen = rPru av 4, Lot 201, I3325						
Positive 1	80	0.63	0.018	2.94	0.035	5.54
Positive 2	82	1.19	0.029	2.45	0.056	4.72
Positive 3	80	7.18	0.258	3.58	0.554	7.71
Allergen = rPru av 4, Lot 201, I3476						
Positive 1	80	0.68	0.019	2.81	0.040	5.92
Positive 2	80	1.25	0.038	3.06	0.080	6.38
Positive 3	80	7.71	0.275	3.56	0.680	8.82

*Outliers detected on Day 12, Run 1, Replicates 1 and 2
**No outliers used in calculation

Allergen = nPru p 3, Lot 110, I3325						
Positive 1	84	0.58	0.024	4.22	0.039	6.82
Positive 2*	84	1.97	0.063	3.22	1.484	75.41
Positive 2**	80	1.65	0.060	3.63	0.111	6.75
Positive 3	84	9.19	0.342	3.73	0.644	7.01
Allergen = nPru p 3, Lot 110, I3474						
Positive 1	84	0.61	0.023	3.69	0.032	5.28
Positive 2*	84	2.08	0.104	4.98	1.634	78.56
Positive 2**	80	1.72	0.068	3.91	0.097	5.62
Positive 3	84	9.45	0.291	3.07	0.457	4.83
Allergen = nPru p 3, Lot 111, I3325						
Positive 1	84	0.58	0.022	3.70	0.037	6.26
Positive 2*	84	1.99	0.061	3.06	1.524	76.70
Positive 2**	80	1.66	0.048	2.87	0.100	6.01
Positive 3	84	9.19	0.241	2.62	0.643	7.00

Allergen = nPru p 3, Lot 111, I3474						
Positive 1	84	0.62	0.018	2.92	0.031	4.95
Positive 2*	84	2.08	0.130	6.24	1.613	77.39
Positive 2**	80	1.73	0.055	3.18	0.095	5.51
Positive 3	84	9.53	0.269	2.82	0.434	4.55
Allergen = nPru p 3, Lot 112, I3325						
Positive 1	84	0.56	0.024	4.32	0.038	6.79
Positive 2*	84	1.95	0.064	3.28	1.531	78.70
Positive 2**	80	1.61	0.57	3.50	0.109	6.74
Positive 3	84	9.25	0.282	3.05	0.626	6.77
Allergen = nPru p 3, Lot 112, I3474						
Positive 1	84	0.60	0.022	3.69	0.034	5.71
Positive 2*	84	2.05	0.152	7.43	1.654	80.67
Positive 2**	80	1.69	0.041	2.44	0.094	5.55
Positive 3	84	9.68	2.98	3.08	0.461	4.76
Allergen = nPru p 3, Lot 201, I3325						
Positive 1	80	0.52	0.022	4.16	0.037	7.17
Positive 2	80	1.49	0.053	3.56	0.085	5.70
Positive 3	80	9.05	0.272	3.00	0.356	3.93
Allergen = nPru p 3, Lot 201, I3476						
Positive 1	80	0.56	0.021	3.73	0.036	6.49
Positive 2	80	1.57	0.045	2.90	0.104	6.64
Positive 3	80	9.58	0.289	3.02	0.486	5.07

*Outliers detected on Day 10, Runs 1 and 2, Replicates 1 and 2

**No outliers used in calculation

Lot-to-Lot variability between four lots on instrument I3325 is presented in the Table 4.

Table 4 – Lot-to-Lot Precision Results

Sample	N	Mean (kU/L)	Repeatability SD (kU/L)	Repeatability CV %	Within-Lab SD (kU/L)	Within-Lab CV %
Allergen = rBet v 2, Lots 110, 111, 112, 201, I3325						
Positive 1	332	0.57	0.066	11.57	0.071	12.57
Positive 2	332	1.55	0.140	9.06	0.157	10.12
Positive 3	332	7.85	0.773	9.86	0.880	11.22
Allergen = rMal d 1, Lots 110, 111, 112, 201, I3325						
Positive 1	332	0.56	0.067	12.01	0.073	13.08
Positive 2	332	2.51	0.370	14.76	0.395	15.75
Positive 3	332	5.45	0.657	12.06	0.713	13.08
Allergen = rMal d 4, Lots 110, 111, 112, 201, I3325						
Positive 1	332	0.63	0.036	5.69	0.041	6.49
Positive 2	332	1.60	0.123	7.66	0.143	8.94
Positive 3	332	7.24	0.472	6.52	0.596	8.23
Allergen = rPru av 1, Lots 110, 111, 112, 201, I3325						
Positive 1	332	0.59	0.049	8.32	0.055	9.29
Positive 2	332	2.39	0.191	7.99	0.327	13.71
Positive 3	332	6.81	0.791	11.62	0.853	12.52
Allergen = rPru av 3, Lots 110, 111, 112, 201, I3325						
Positive 1	332	0.54	0.053	9.75	0.056	10.36
Positive 2	332	1.41	0.145	10.25	0.158	11.16
Positive 3	332	8.91	0.947	10.63	1.035	11.61
Allergen = rPru av 4, Lots 110, 111, 112, 201, I3325						
Positive 1	332	0.62	0.027	4.33	0.036	5.83
Positive 2	334	1.26	0.109	8.67	0.198	15.74
Positive 3	332	8.32	0.829	9.95	0.928	11.14

Allergen = nPru p 3, Lots 110, 111, 112, 201, I3325						
Positive 1	332	0.56	0.038	6.70	0.045	7.93
Positive 2*	332	1.85	0.728	39.33	1.351	72.99
Positive 2**	320	1.60	0.091	5.67	0.123	7.71
Positive 3	332	9.07	0.469	5.17	0.864	9.52

*Outliers detected on Day 10, Runs 1 and 2, Replicates 1 and 2
**No outliers used in calculation

Precision of rBet v 2, rMal d 1, rMal d 4, rPru av 1, rPru av 3, rPru av 4, and nPru p 3 meet the criteria for acceptable repeatability, within-lab, and lot-to-lot precision. Repeatability is less than 15% for all allergen lots, within-lab precision is less than 15% for all allergen lots, and lot-to-lot precision is less than 20% for all seven allergens. The negative control remained negative (<0.10 kU/L) throughout precision testing on all allergens.

8.2 Detection Limits

The working range for the The IMMULITE 2000 3gAllergy Specific IgE Universal Kit is 0.10 – 100 kU/L standardized to the 2nd WHO IRP (75/502) for human serum IgE.

The Limit of Blank (LoB):

Four blank samples were tested in replicates of two, with one run per day, over five days, using two instruments and three lots of allergen. A total of 80 data points were collected for each allergen lot. The LoB was calculated for each sample using the non-parametric method in accordance with CLSI EP17-A. The Limit of Blank was determined separately for each allergen lot and was established as the highest of the three. The LoB results are presented in Table 5.

Table 5 – Limit of Blank Results Summary

Allergen	Lot	Limit of Blank (kU/L)
rBet v 2 (A127)	111	**0.03**
	112	0.02
	201	**0.03**
rMal d 1 (A464)	110	**0.02**
	111	**0.02**
	201	**0.02**
rMal d 4 (A796)	111	**0.02**
	112	**0.02**
	201	0.00
rPru av 1 (A597)	111	**0.02**
	112	**0.02**
	201	0.00

Allergen	Lot	Limit of Blank (kU/L)
rPru av 3 (A599)	111	**0.06**
	112	0.05
	201	0.01
rPru av 4 (A600)	111	**0.02**
	112	**0.02**
	201	0.01
nPru p 3 (A603)	111	**0.02**
	112	**0.02**
	201	0.01

The Limit of Blank (highest value expected for a sample with no analyte) was ≤0.03 kU/L for rBet v 2, rMal d 1, rMal d 4, rPru av 1, rPru av 3, and nPru p 3 and 0.06 kU/L for rPru av 4.

The Limit of Detection (LoD):
Four low positive samples were tested in replicates of two, with one run per day, over five days, using two instruments and three lots of allergen A total of at least 60 data points were collected for each allergen lot. The LoD was calculated using the formula: $LoD = LoB_{Max} + c_p SD_{LoD}$. The Limit of Detection was determined separately for each allergen lot and was established as the highest of the three. The LoB results are presented in Table 6.

Table 6 – Limit of Detection Results Summary

Allergen	Lot	Limit of Detection (kU/L)
rBet v 2 (A127)	111	0.05
	112	0.05
	201	**0.06**
rMal d 1 (A464)	110	**0.04**
	111	**0.04**
	201	**0.04**
rMal d 4 (A796)	111	**0.06**
	112	0.04
	201	0.04
rPru av 1 (A597)	111	**0.06**
	112	**0.06**
	201	0.05
rPru av 3 (A599)	111	**0.09**
	112	0.08
	201	**0.09**

Allergen	Lot	Limit of Detection (kU/L)
rPru av 4 (A600)	111	0.04
	112	0.03
	201	**0.05**
nPru p 3 (A603)	111	0.04
	112	**0.05**
	201	0.04

The Limit of Detection (lowest detectable concentration) was ≤0.10 kU/L for rBet v 2, rMal d 1, rMal d 4, rPru av 1, rPru av 3, rPru av 4, and nPru p 3.

8.3 Specificity (Inhibition) Studies:

Specificity of each allergen was verified through competitive inhibition testing using a single serum sample or pool of sera. A negative sample was used to measure the background response.

To initiate the inhibition experiment, minimally 5 levels of 5-fold diluted inhibitor extract were mixed with sample or pool at a ratio of 1:1 to achieve final inhibitor concentrations of 50 µg/mL and lower. The inhibitor/sample mixtures were incubated at room temperature (15-28°C) for 1 hour allowing the immunological reaction to occur. Each sample mixture containing the inhibitor extract and appropriate controls were assayed with one lot of each allergen. The percent (%) inhibition was calculated according to the following formula:

$[(C - A)/C] \times 100$
C = mean response of the positive control (positive sample - negative sample)
A = mean response of sample with inhibitor extract

The inhibition demonstrates that the allergens tested are inhibited by the relevant inhibitor extract in a concentration dependent fashion. Also, the target % inhibition of 50% for the highest inhibitor concentration tested was met. These results indicate specificity of the rBet v 2, rMal d 1, rMal d 4, rPru av 1, rPru av 3, rPru av 4, and nPru p 3 allergens.

8.4 Inhibition Using Negative Controls:

Additional inhibition studies were conducted to show that the specific allergens are not cross-reacting to unrelated allergens. Three irrelevant allergens as well as any related components were included as additional controls. The related components were other components of the parent allergen or another component from the same group. The final inhibitor concentrations of the additional inhibitors ranged from 500 µg/mL to 1250 µg/mL, determined as 10x the concentration needed to achieve ~100% inhibition on its own allergen device. Each allergen with the irrelevant and related extracts did not generate inhibition greater than 15%. These results indicate specificity of the rBet v 2, rMal d 1, rMal d 4, rPru av 1, rPru av 3, rPru av 4, and nPru p 3 allergens.

8.5 Linearity:

The assay is calibrated to the WHO 2nd IRP 75/502 reference standard for total IgE. The working range is supported in the following manner: Each allergen was scaled to confirm linearity. The calibration curve for the assay is utilized for reporting IgE dose values for all allergens assayed. To confirm the working range of 0.10 to 100 kU/L, a linearity study was performed with the calibrator antibody using a minimum of 3 samples scaled throughout the reportable range of the assay.

Two positive samples were diluted with a negative sample at levels ranging from 20% to 100% per CLSI EP06-A. The negative sample was run neat as a control. Each sample was run in replicates of three with two allergen lots. The expected dose (kU/L) was extrapolated from the neat positive value and the linearity dilutions. A linear regression was performed by plotting the observed dose (y-axis) versus the expected dose (x-axis) as shown in Table 7.

Table 7: Linearity Table

Allergen	Lot	Regression Equation	r	N	Slope 95% CI	Intercept 95% CI	Range Tested (kU/L)
rBet v 2	111	y = 1.003x + 0.006	0.998	12	0.953 to 1.053	-0.050 to 0.061	0.46 to 13.08
	112	y = 1.035x + 0.006	0.998	12	0.987 to 1.083	-0.043 to 0.056	0.43 to 12.81
rMal d 1	110	y = 1.012x + 0.091	1.000	12	0.986 to 1.039	0.002 to 0.180	1.48 to 24.74
	111	y = 1.036 - 0.075	0.999	12	1.001 to 1.070	-0.199 to 0.049	1.42 to 26.33
rMal d 4	111	y = 0.958 + 0.042	0.999	12	0.921 to 0.995	0.011 to 0.074	0.35 to 11.55
	112	y = 0.984x + 0.018	0.998	12	0.936 to 1.032	-0.022 to 0.058	0.32 to 11.58
rPru av 1	111	y = 1.047x - 0.030	0.999	12	1.013 to 1.081	-0.053 to -0.007	0.24 to 14.08
	112	y = 1.054x + 0.020	0.998	12	0.999 to 1.110	-0.014 to 0.055	0.25 to 18.52
rPru av 3	111	y = 1.004x + 0.048	0.999	12	0.978 to 1.031	0.023 to 0.074	0.43 to 13.55
	112	y = 0.992x + 0.058	0.999	12	0.961 to 1.023	0.028 to 0.088	0.44 to 13.36
rPru av 4	111	y = 0.967 + 0.018	1.000	12	0.945 to 0.989	-0.003 to 0.040	0.38 to 19.95
	112	y = 0.984x + 0.034	1.000	12	0.960 to 1.009	0.010 to 0.058	0.41 to 19.35
nPru p 3	111	y = 0.989x + 0.049	0.999	12	0.960 to 1.019	0.018 to 0.081	0.47 to 15.62
	112	y = 1.000x + 0.022	0.999	12	0.966 to 1.034	-0.014 to 0.057	0.43 to 15.29

9. **Clinical Performance Testing:**

Clinical performance was demonstrated by testing serum samples against specific allergens from clinically diagnosed atopic and non-atopic individuals. Allergen-specific testing was obtained using the IMMULITE® 2000 3gAllergy™ Specific IgE Universal Kit.

Data summary agreement of the IMMULITE® 2000 3gAllergy™ Specific IgE Universal Kit test results to clinical data is shown in Table 8.

Table 8: Clinical Data Summary

Clinical Diagnosis Data			
IMMULITE® 2000 Analyzer	**Clinical**	**Normal**	**Total**
Positive	153	9	162
Negative	174	810	984
Total	327	819	1,146
	46.8%	98.9%	84.0%
	Sensitivity	**Specificity**	**Agreement**
Lower Confidence Interval	42.1%	98.1%	82%
Upper Confidence Interval	51.5%	99.4%	86%
Allergens included: **rBet v 2, rMal d 1, rPru av 1, rPru av 3, rPru av 4, nPru p 3 and rMal d 4**			

IMMULITE® 2000 3gAllergy™ Specific IgE Universal Kit test results for all allergens compare well with clinical documentation of presence or absence of signs, symptoms and other diagnostic evidence of allergen sensitivity

10. **Conclusion:**

The IMMULITE® 2000 3gAllergy™ Specific IgE Universal Kit is substantially equivalent to other products in commercial distribution intended for similar use. Most notably, it is substantially equivalent to the currently marketed device. The substantial equivalence of the device is supported by clinical and non-clinical testing and was found to be comparable and supports the claims of substantial equivalence, product safety and effectiveness. Based on the testing completed and the comparisons with predicate device, the IMMULITE® 2000 3gAllergy™ Specific IgE Universal Kit does not raise any new questions on safety and effectiveness and the results support a determination of substantial equivalence.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
10903 New Hampshire Avenue
Document Control Center – WO66-G609
Silver Spring, MD 20993-0002

SIEMENS HEALTHCARE DIAGNOSTICS, INC.
C/O MR. ERNEST JOSEPH
SENIOR MANAGER REGULATORY AFFAIRS IMMULITE AND RIA PRODUCT LINES
511 BENEDICT AVENUE
TARRYTOWN, NY, 10591

May 28, 2014

Re: K132801
Trade/Device Name: IMMULITE 2000 3gAllery™ Specific IgE Universal Kit
Regulation Number: 21 CFR § 866.5750
Regulation Name: Radioallergosorbent (RAST) immunological test system
Regulatory Class: Class II
Product Code: DHB
Dated: May 2, 2014
Received: May 5, 2014

Dear Mr. Joseph:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part 801); medical device reporting (reporting of medical

device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801), please contact the Division of Industry and Consumer Education at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Industry and Consumer Education at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm.

Sincerely yours,

Maria M. Chan -S

Maria M. Chan, Ph.D.
Director
Division of Immunology and Hematology Devices
Office of In Vitro Diagnostics
and Radiological Health (OIR)
Center for Devices and Radiological Health

Enclosure

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Food and Drug Administration

Indications for Use

Form Approved: OMB No. 0910-0120
Expiration Date: January 31, 2017
See PRA Statement below.

510(k) Number *(if known)*
K132801

Device Name
IMMULITE® 2000 3gAllergy™ Specific IgE Universal Kit

Indications for Use *(Describe)*
The 3gAllergy™ Specific IgE Universal Kit is for in vitro diagnostic use with the IMMULITE® 2000 Analyzer — for the quantitative measurement of allergen-specific IgE in human serum, as an aid in the clinical diagnosis of IgE-mediated allergic disorders. The test results are to be used in conjunction with clinical findings and other laboratory tests.

Type of Use *(Select one or both, as applicable)*

☒ Prescription Use (Part 21 CFR 801 Subpart D) ☐ Over-The-Counter Use (21 CFR 801 Subpart C)

PLEASE DO NOT WRITE BELOW THIS LINE – CONTINUE ON A SEPARATE PAGE IF NEEDED.

FOR FDA USE ONLY

Concurrence of Center for Devices and Radiological Health (CDRH) *(Signature)*

Elizabeth A. Stafford -S

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